

Langdon (F. W.)

Tenotomy x x x x x x x

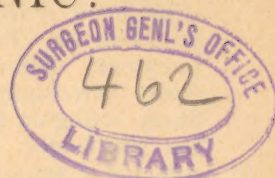


al

THE CINCINNATI LANCET-CLINIC:

A WEEKLY JOURNAL OF
MEDICINE AND SURGERY.

JULY—DECEMBER, 1890.



New Series Vol. XXV.

CINCINNATI, July 5, 1890.

Whole Volume LXIV.

Original Articles.

TENOTOMY TO INCREASE THE MOBILITY AND POWER OF THE MUSICIAN'S RING-FINGER.

A Paper read before the Cincinnati Medical
Society, March 25, 1890,

BY

F. W. LANGDON, M.D.,
CINCINNATI.

The limited range of independent extension possessed by the fourth digit of the hand is well known to all observing persons; and is usually a most formidable stumbling-block to the pianist and other performers on keyed and stringed instruments, in the production of certain notes, and musical effects, as trills for example.

The causes of this impairment of mobility, which is associated with a corresponding lack of power in the digit, are two in number, namely: (1) mechanical, due to structural peculiarities of the parts; and (2) physiological, due to insufficiency of muscular development; the latter being dependent on the former.

The mechanical obstacles to free extension, as anyone may satisfy himself by dissection, or even by examination of the average living hand, are two oblique tendinous bands, situated about three-quarters of an inch above the knuckle line, connected proximally with the extensor tendon of the ring-finger and distally with the common extensor tendons on either side, namely: those to the middle and little fingers.

That these subsidiary tendons act as "guy ropes," and limit the extensor range of the ring-finger especially, may be determined by anyone for himself, by placing the hand on a flat surface and extending, first, the ring-finger alone; then extension of its neighbors on either side will demonstrate that all three can be brought higher than either one alone. The little finger is seen to be less affected than either of the others, owing to its possession of a proper extensor, which is free, while the middle finger is less limited than the ring, by reason of having the "guy" tendon on one side only.

These diagonal tendinous bands are constantly present, so far as my observation extends, though varying somewhat in development and position in different persons. Concerning their probable use, I am not aware that they are in any way an advantage to their possessor, considering the hand in its ordinary relations, though they would materially add strength to the hand, if used as an organ of locomotion, by reason of limiting its "spread." Looked at from a morphological standpoint, these slips may be considered as one of the many useless legacies transmitted to us from a remote ancestry, or, as a lady friend puts it, they are perhaps, "relics of a former incarnation."

Not only is extension of the ring-finger diminished, but separation of the three inner digits is materially lessened by the presence of these apparently insignificant slips, so that the lateral "spread" of the digits is impaired to such a degree as to become an important matter to the musician. And again, in addition to the mere limited range of

motion, both vertically and laterally, due to the mechanical effects of these slips, there is also to be considered the physiological factor, viz.: lessened functional activity and consequently faulty development of the muscular fibres acting on the extensor tendon of the ring-finger, namely, fibres of the common extensor, fourth dorsal interosseous and third lumbricalis. This fault of development is a more important matter than would appear at first glance, since it is mainly by the interossei and lumbricales that the first phalanges are flexed and the second and third extended, whence the name "fiduciales."

It follows, therefore, that from this insufficiency of muscular development there results a lack of power as well as of range in the quicker movements of the fingers required of the pianist and violinist.

Granting the correctness of these premises based on anatomical and physiological data, division of these diagonal slips may be expected to: (1) admit of immediate increase of range of mobility, both vertically and laterally, in the three inner fingers; and (2) promote, by reason of greater functional activity, muscular power, especially as affecting the ring-finger. That the first of these conditions results I am prepared to illustrate by a case recently operated upon; that the second will follow in time is extremely probable, but to what extent remains to be proven.

The patient, Mr. B., a gentleman of scientific and musical tastes, consulted me a few weeks ago, with a view to increasing, if possible, the usefulness of his ring-finger; and division of the diagonal slips was decided upon and agreed to. The steps of the operation were as follows: The field of operation was prepared by thorough cleansing (for which purpose I prefer soap and water, followed, after thorough drying, with common benzoin, and this by solution bichloride mercury 1—1000.) The skin, with a large branch of the dorsal venous arch, was now slipped aside with the thumb, so as to leave clear of vessels the interspace between the third and fourth metacarpals in the

neighborhood of the proposed incision. Moderate flexion of the patient's hand enabled the operator's finger to define the position and direction of the outer (radial) connecting slip, which varies slightly in different subjects; its middle averaging perhaps three-quarters of an inch above the knuckle line. With an ordinary sharp pointed tenotomy knife a longitudinal incision, one-eighth inch in length, midway between the third and fourth metacarpals, and just to the distal side of the slip to be divided, is carried through the skin and superficial fascia. The exact location of the slip having now been determined by means of a probe—the deep fascia is incised at the lower edge of the slip and the point of the knife carried directly upward, *i. e.* toward the wrist, beneath the slip, which parts with the characteristic creaking sound and feel. If not sufficiently tense to divide easily, it may be made more resistant by directing the patient to flex the fingers a little more strongly. The dressing consisted of a pledget of absorbent cotton held in place by adhesive strapping.

A marked increase in range of independent extension was at once evident, and within a few days the patient remarked a greater precision of touch—there being no tendency to the lateral twisting which had before annoyed him—and which was at this time observable in the other hand. Union of the wound was complete when the dressing was removed on the third day, and the result of the operation was so satisfactory to the patient that he at once submitted the other hand to be operated on. The motion attained in both cases was so satisfactory that it was deemed unnecessary to divide the slip going to little finger tendon. In some extreme cases, however, this also would probably require division, in which event it would be well to bear in mind its lesser length, and not mistake for it the common extensor tendon, going to the fifth digit.

The height to which our patient's fingers can be extended independently (one at a time) the palmar surface of the hand being in close contact with a plane surface and measurements taken

from that surface to the free edge of the nail, is now as follows:

Right hand.	inches.	or	mm.
Index finger	$3\frac{11}{16}$	"	94
Middle "	$3\frac{6}{16}$	"	86
Ring "	$2\frac{7}{16}$	"	62
Little "	$2\frac{1}{16}$	"	52
Left hand.	inches.	or	mm.
Index finger	$3\frac{9}{16}$	"	79
Middle "	$3\frac{1}{16}$	"	76
Ring "	$2\frac{6}{16}$	"	60
Little "	$2\frac{9}{16}$	"	65

It is to be regretted that the importance of securing measurements before the operation was overlooked. Few persons, however, if any, will be found who can make independent extension of their ring-finger to half the extent here indicated.

The measurements illustrate: (1) greater elevation of right ring-finger than of little finger—a condition probably unknown to the normal hand; (2) on the left, the gain of ring-finger, while perceptible to the eye at the time of operation, does not quite reach the range of the little finger; (3) the measurements also illustrate the greater extensor range of all the fingers of the right as compared with the left hand, thus affording conclusive evidence of the effect on muscular power of increased functional activity.

It is intended to complete these observations by future measurements to determine how much, if any, increased range of movement may result from the freer motion and greater muscular activity now permitted.

By way of summary, we may conclude:

1. That division of one or both of the diagonal tendinous slips, connecting the extensor tendon of the ring-finger, with those of the middle and little fingers, is a simple and almost painless procedure, which is followed by marked improvement in range of motion vertically and laterally, of the three inner fingers.

2. That this improved mobility is especially notable and important in the case of the ring-finger; and that the usefulness of this digit to the musician is greatly augmented at once.

3. Owing to increased functional activity permitted in the muscular fibres acting on this digit, progressive development in power may be expected to follow.

TENOTOMY TO INCREASE THE
MOBILITY AND POWER OF
THE MUSICIAN'S RING-
FINGER.⁽¹⁾

ADDITIONAL NOTES.

BY

F. W. LANGDON, M.D.,
CINCINNATI.

The following extracts from a letter received from the subject of the operation noted above, nearly five months after operation, are of interest:

"Have yet had no cause to regret the operation, but, on the contrary, have often felt very glad, indeed, that it was performed.

"I find that my hand does not grow tired as it did before, when I use the ring-finger a great deal; * * the benefits of the operation are manifold.

"When I make a trill on a keyed instrument with the ring-finger, the benefit is at once noticed. Not only is the ring-finger helped, but, of course, the middle and little fingers also.

"I can lift my fingers just about as high as when you measured them, but the strength is increased greatly."

1 LANCET-CLINIC, July 5, 1890, page 1.

